

Warm-up

- a) Explain why it is important to keep your bank card PIN secure.

- b) List three ways that you can protect your personal banking information.

Definitions

simple interest: interest calculated as a percentage of the principal.

principal: the original amount invested or borrowed.

term: the time in years for an investment or loan.

compound interest: the interest paid on the principal plus interest.

compounding period: the time between calculations of interest, also called the interest period.

Compounding Periods

semi-annually: every 6 months (twice a year).

quarterly: every 3 months (four times a year).

monthly: every month (twelve times a year).

daily: every day (365 times a year).

EXPLORE THE MATH

When you deposit money into a savings or investment account, you earn interest from your financial institution because you are lending them your money. When you borrow money, you must pay interest to the financial institution. The interest you pay is compensation to the lender for the use of their money.

Simple interest is based on the original amount, or principal, invested or borrowed. Interest is usually stated as a certain percentage per annum (per year). Simple interest is often used for personal loans and short-term investments. The time in years for the investment or loan is called the term of the investment.

If you keep the interest earned in your account, new interest may be paid on the principal plus that interest. This is called compound interest. Compound interest can be paid more than once a year. The interest rate is stated per annum and is divided by the number of compounding periods per year.

Simple vs Compound Interest

Let's compare what happens if your invested money is accruing interest using simple interest vs compound interest.

Both investments will be an original principal amount of \$500, collecting 5% interest per annum for 5 years.

Simple Interest

Interest Period	Investment value at beginning of period	Interest Earned	Investment value at end of period
1			
2			
3			
4			
5			

Compound Interest

Interest Period	Investment value at beginning of period	Interest Earned	Investment value at end of period
1			
2			
3			
4			
5			

Simple Interest

Gordon wants to invest \$2000.00. His bank offers an investment option that earns simple interest at a rate of 1.75% per year.

- a) Complete the calculations table showing simple interest over 5 years.

Interest Period	Investment value at beginning of period	Interest Earned	Investment value at end of period
1			
2			
3			
4			
5			

Total value at end of 5 years: _____

- b) Is there a shortcut or formula?????

Simple Interest

$$I = PRT$$

I = interest earned

P = principal amount

R = interest rate

T = term (time invested)

Gordon wants to invest \$2000.00. His bank offers an investment option that earns simple interest at a rate of 1.75% per year.

Compound Interest

Allison wants to invest \$2000.00. Her bank offers an investment option that earns compound interest at a rate of 1.75% per year.

- a) Complete the calculations table showing simple interest over 5 years.

Interest Period	Investment value at beginning of period	Interest Earned	Investment value at end of period
1			
2			
3			
4			
5			

Total value at end of 5 years: _____

- b) Is there a shortcut or formula?????

Compound Interest

$$A = P \left(1 + \frac{r}{n} \right)^{nt}$$

A = future value

P = principal amount

r = interest rate

n = number of compounding periods per year.

t = time in years

Allison wants to invest \$2000.00. Her bank offers an investment option that earns compound interest at a rate of 1.75% per year.

You Try

Murray deposits \$6700 into an investment which earns 3.2% per annum, compounded semi-annually over 2 years. Complete both the table and the formula to find the value of the investment after 2 years.

Interest Period	Investment value at beginning of period	Interest Earned	Investment value at end of period
1			
2			
3			
4			
5			

GUARANTEED INVESTMENT CERTIFICATES

Vyanjana has received a special gift of \$5000.00 from her grandparents, which she plans to invest for the future. She has researched investment options at her bank, and has decided to buy a Guaranteed Investment Certificate (GIC). GICs guarantee that the investor will receive his or her principal as well as a fixed amount of interest.

She has narrowed her choices down to three options:

Option 1: A GIC that offers 1.125% interest per annum, compounded monthly, with a one-year term. This GIC cannot be redeemed before the end of the term, so Vyanjana will not be able to access her money before the end of the one year term.

Option 2: A GIC that offers 0.875% interest per annum, compounded monthly, with a one-year term. This GIC can be redeemed before the end of the term, but if Vyanjana wants to access her money before the end of the year, her investment will earn only 0.050% interest per annum.

Option 3: A GIC that offers 1.250% interest per annum, compounded annually, with a one-year term. The GIC cannot be redeemed before the end of the term.

Calculate how much interest Vyanjana would earn with each option. For option 2, calculate how much interest Vyanjana would earn after 6 months and after the full term of the investment.